

WHAT IS CLAIMED IS:

1. A micro pumping device for transporting small volumes of biological fluid comprising:

a cartridge comprising at least one pliable surface, wherein said cartridge is adapted to receive at least one biological fluid, said pliable surface comprising a deformable material which collapses in response to a compression force; and

a collapsor for collapsing for applying said compression force.
2. A micro pumping device according to claim 1 wherein:

said cartridge comprises a rigid core adjacent to said pliable surface and opposite said collapsor, said rigid surface adapted to aid said collapsor in collapsing said pliable surface.
3. A micro pumping device according to claim 1 wherein:

said cartridge comprises at least one component chosen from reservoirs, channels, and valves, wherein said component contains the flow of said biological fluid.
4. A micro pumping device according to claim 1 wherein:

said collapsor comprises at least one bearing chosen from roller bearings and ball bearings.
5. A micro pumping device according to claim 4 wherein:

said collapsor comprises a collapsor surface with protrusions.
6. A micro pumping device according to claim 5 wherein:

said collapsor surface comprises a circumference of said bearing; said protrusions disposed at predetermined locations about said circumference such that each adjacent pair of protrusions defines a correspondingly predetermined volume.
7. A micro pumping device according to claim 1 wherein:

said collapsor comprises a series of plungers, said plungers having a longitudinal axis oriented perpendicular to said pliable surface.
8. A micro pumping device according to claim 1 wherein:

said collapsor comprises a singular member, said member having a longitudinal axis oriented less than perpendicular to said pliable surface.

9. A micro pumping device according to claim 1 wherein said device further comprises:

a network comprising staggered channels and reservoirs such that motion in one direction by said collapsor results in a sequential collapse of said staggered channels and reservoirs.

10. A micro pumping device according to claim 9 wherein:

said network comprises a system of check valves preventing backflow through said reservoirs and channels.

11. A micro pumping device according to claim 1 wherein:

said deformable material comprises a self-sealing membrane.

12. A micro pumping device for transporting biological fluid comprising:

a first reservoir for containing at least one first biological fluid, said first reservoir comprising a deformable material;

a second reservoir for containing a second biological fluid; said second reservoir comprising a deformable material;

a mixing chamber to collect a mixture of the first and second biological fluids; said chamber connected to said first reservoir and said second reservoir through a channel, said channel forking into a first leg and a second leg, said first leg connected to said first reservoir, and said second leg connected to said second reservoir, said mixing chamber and said channel comprising a deformable material; and

a means for collapsing said first reservoir, said second reservoir, and said channel.

13. A method of micro pumping biological fluid comprising:

collapsing a cartridge matrix comprising at least one pliable surface and at least one reservoir and channel, wherein said collapsing is adapted to transport biological fluid contained within said reservoir.

14. A method of micro pumping according to claim 13 wherein:

said collapsing comprises sweeping across said at least one pliable surface with at least one of the following: a roller bearing, a ball bearing, or a unitary member.

15. A method of micro pumping according to claim 13 wherein:

said collapsing comprises pressing down on said pliable surface with plungers.

16. An analytical instrument comprising:

a cartridge adapted to receive at least one biological fluid, said cartridge comprising an analytical system chosen from electrochemical, chemiluminescence, optical, electrical, and mechanical methods, wherein said cartridge comprises a pliable surface; and

a collapsor adapted to transporting small volumes of biological fluid for said analytical system by collapsing said pliable surface with a compression force.

17. An analytical instrument according to claim 16 wherein:

said collapsor comprises at least one bearing chosen from roller bearings and ball bearings.

18. An analytical instrument according to claim 16 wherein:

said collapsor comprises a series of plungers, said plungers having a longitudinal axis oriented perpendicular to said pliable surface.

19. An analytical instrument according to claim 16 wherein:

said collapsor comprises a singular member, said member having a longitudinal axis oriented less than perpendicular to said pliable surface.